UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/582,939	10/27/2000	Ulrik Pagh Schultz	P-5857	4543

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	ART UNIT	PAPER NUMBER

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DATE MAILED: 08/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on *18 June 2004*.

2a) ☐ This action is **FINAL.**   2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
   closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) <u>23-34</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) <u>23-34</u> is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All   b) ☐ Some * c) ☐ None of:

      1. ☐ Certified copies of the priority documents have been received.

      2. ☐ Certified copies of the priority documents have been received in Application No. _____.

      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage
         application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1.   This action is in response to the RCE filed on 6/18/04.

2.   The objections to claims 12 and 18 are moot in view of applicant's amendments.

3.   The rejection under 35 U.S.C. 102(e) as being anticipated by Siska (U.S. 6,263,429) to

claims 12-22 is moot in view of applicant's amendments.

4.   Claims 12-22 have been cancelled.

5.   Claims 23-34 have been added.

6.   Claims 23-34 are pending.

7.   Claims 23-26 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with

the written description requirement.

8.   Claims 23-26 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with

the enablement requirement.

9.   Claims 23-26 and 29 are rejected under 35 U.S.C. 112, second paragraph, as being

indefinite for failing to particularly point out and distinctly claim the subject matter which

applicant regards as the invention.

10.   Claims 23-34 are rejected under 35 U.S.C. 102(e) as being anticipated by Siska (U.S.

6,263,429).

Response to Amendment

Claim Rejections - 35 USC § 112

11.   The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making
> and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it

> pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode
> contemplated by the inventor of carrying out his invention.

12.   Claims 23-26 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with

the written description requirement. The claim(s) contains subject matter which was not

described in the specification in such a way as to reasonably convey to one skilled in the relevant

art that the inventor(s), at the time the application was filed, had possession of the claimed

invention.

Claim 23 recites the limitation "searching through said intermediate program in said

native machine code language for identical sequences of successive standard instructions" on

lines 6-7 of the claim, and the limitation "generating a macroinstruction corresponding to a

specific instruction in said native machine code language" on lines 13-14 of the claim.

The specification describes that "a program language interpreter capable of turning

intermediate object code into instructions of an object code that can be run directly by a

microprocessor" on page 3, 3rd paragraph, lines 3-4, "the *intermediate object code program* is

searched in order to find identical sequences of successive standard instructions" on page 3, 3rd

paragraph, lines 6-7, and "Once the compacting operation has been performed by the compactor

system, there exists an intermediate object code program" on page 10, 5th paragraph, lines 1-2.

That is, the *intermediate program* is **not** searched in said native machine code language, instead

the intermediate program is searched in its intermediate object code form. Furthermore, the

macroinstruction is generated in intermediate object code form.

Therefore, these limitations are interpreted as "searching through said intermediate

program in *intermediate object code* for identical sequences of successive standard instructions"

and "generating a macroinstruction corresponding to a specific instruction in said *intermediate object code*", respectively.

Claims 24-26 are rejected for dependency upon rejected base claim 23.

13.   Claims 23-26 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claim 23 recites the limitation "searching through said intermediate program in said native machine code language for identical sequences of successive standard instructions" on lines 6-7 of the claim, and the limitation "generating a macroinstruction corresponding to a specific instruction in said native machine code language" on lines 13-14 of the claim.

The specification describes that "a program language interpreter capable of turning intermediate object code into instructions of an object code that can be run directly by a microprocessor" on page 3, 3rd paragraph, lines 3-4, "the *intermediate object code program* is searched in order to find identical sequences of successive standard instructions" on page 3, 3rd paragraph, lines 6-7, and "Once the compacting operation has been performed by the compactor system, there exists an intermediate object code program" on page 10, 5th paragraph, lines 1-2. That is, the *intermediate program* is **not** searched in said native machine code language, instead the intermediate program is searched in its intermediate object code form. Furthermore, the macroinstruction is generated in intermediate object code form.

Therefore, these limitations are interpreted as "searching through said intermediate

program in *intermediate object code* for identical sequences of successive standard instructions"

and "generating a macroinstruction corresponding to a specific instruction in said *intermediate*

object code", respectively.

Claims 24-26 are rejected for dependency upon rejected base claim 23.

14.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the
> subject matter which the applicant regards as his invention.

15.   Claims 23-26 and 29 are rejected under 35 U.S.C. 112, second paragraph, as being

indefinite for failing to particularly point out and distinctly claim the subject matter which

applicant regards as the invention.

16.   Claim 23 recites the limitation "searching through said intermediate program in said

native machine code language for identical sequences of successive standard instructions" on

lines 6-7 of the claim, and the limitation "generating a macroinstruction corresponding to a

specific instruction in said native machine code language" on lines 13-14 of the claim, which

renders the claim indefinite.

The specification describes that "a program language interpreter capable of turning

intermediate object code into instructions of an object code that can be run directly by a

microprocessor" on page 3, 3rd paragraph, lines 3-4, "the *intermediate object code program* is

searched in order to find identical sequences of successive standard instructions" on page 3, 3rd

paragraph, lines 6-7, and "Once the compacting operation has been performed by the compactor

system, there exists an intermediate object code program" on page 10, 5th paragraph, lines 1-2.

That is, the *intermediate program* is **not** searched in said native machine code language, instead

the intermediate program is searched in its intermediate object code form. Furthermore, the

macroinstruction is generated in intermediate object code form.

Therefore, these limitations are interpreted as "searching through said intermediate

program in *intermediate object code* for identical sequences of successive standard instructions"

and "generating a macroinstruction corresponding to a specific instruction in said *intermediate*

object code", respectively.

Claims 24-26 are rejected for dependency upon rejected base claim 23.

17.   Claim 29 recites the limitation "the stack associated with the standard instructions" in line

2 of the claim. There is insufficient antecedent basis for this limitation in the claim. Therefore,

this limitation is interpreted as "a stack associated with the standard instructions".

Claim Rejections - 35 USC § 102

18.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

19.   Claims 23-34 are rejected under 35 U.S.C. 102(e) as being anticipated by Siska (U.S.

6,263,429).

Per Claim 23:

The Siska patent discloses:

-. a method of compacting an intermediate program consisting of a sequence of standard instructions, used in an on-board system, said on-board system being provided with a memory and a program language interpreter capable of turning the intermediate program into instructions of an object code, in a native machine code language, that can be run directly by a microprocessor ("The present invention preferably provides a technique for compressing a program utilized by an embedded processor without significantly degrading the performance of the embedded processor. Additionally, the compression technique of the present invention may preferably be utilized on individual code modules, linked executables, non-emdedded processor programs, and any other sequence of lines of code." in column 5, lines 33-39; column 11, lines 57-67 to column 12, lines 1-67; Fig. 2; Fig. 4, item 400 "UNCOMPRESSED PROGRAM"; and Fig. 5B; microprocessors are commonly referred to as embedded processors; that is, microprocessors are relied upon to perform numerous and varied functions for portable objects, such as personal digital assistants, smart phones, and etc. Therefore, Siska does disclose an on-board system. Siska also discloses an intermediate program, see Fig. 4, item 400 "UNCOMPRESSED PROGRAM". Siska also discloses a program language interpreter, see column 11, lines 57-67 to column 12, lines 1-67 and Fig. 5B.)

- a) searching through said intermediate program in intermediate object code for identical sequences of successive standard instructions ("As shown in the flow chart in Fig. 3a, the compression method of the present invention preferably begins with searching a program for identical sequences of lines of code, sequences of lines of code which include repeated patterns, and the like using standard sequence identification techniques (step 300)." in column 7, lines 42-47)

- b) subjecting said identical sequences of successive instructions to a comparison test to find a function, based on at least the number of occurrences of these sequences in said intermediate program, that is higher than a reference value and, if the test returns a positive response, for each identical sequence of successive standard instructions which satisfies said test step ("Numerous sequence identification schemes are commonly known in the art, the present invention does not address the method of finding sequences of lines of code, hence any method, including the use of wildcards, greedy algorithms, or the like may be suitably utilized in the present invention to identify sequences of lines of code which occur with enough frequency to justify compression. ... Once the examination of the program for common sequences is accomplished, one of the collections is selected (step 301). The basis of this selection is preferably that replacement in the program of each sequence in the collection by a microcall results in the greatest compression of all the collections which might be so selected." in column 7, lines 49-56; column 7, lines 64-67 to column 8, lines 1-5)

- c) generating a macroinstruction corresponding to a specific instruction in said

intermediate object code, by defining a specific operating code and associating said specific

operating code with the sequence of successive standard instructions which satisfied said

test ("After a collection is identified in step 301, preferably one incidence of the sequence of

lines of codes from the identified collection is preferably designated as a microroutine (step

302)." in column 8, lines 6-9)

- d) replacing each occurrence of each sequence of standard successive instructions in said

intermediate program with said specific operating code associated with it to obtain a

compacted intermediate program, consisting of a series of standard instructions and

specific operating codes ("If the microroutine selected in step 302 fits within the MCA 216,

then the microroutine is suitably saved in the MCA 216 (step 305). Additionally, each sequence

of lines of code in the collection is replaced in the program by a microcall to the saved

microroutine (step 306)." in column 8, lines 24-28)

- e) storing in said memory an execution table which enables a reciprocal link to be

established between each specific operating code inserted and the sequence of successive

standard instructions associated with the latter, said program language interpreter being

adapted to read both specific instructions and standard instructions, making it possible to

execute said specific instructions, by calling on said execution table, thereby enabling the

memory space occupied by said compacted intermediate program to be optimized by

storing only one occurrence of said identical sequences of successive standard instructions

in said memory ("The cache memory 206 preferably includes a Micro Code Area ("MCA") 216

(within which microroutines are suitably stored) and a Microroutine Contiguity Table ("MCT")

218. The non-cache memory 208 preferably contains storage locations for at least one program

210 which can be further subdivided into individual lines of code interspersed with microcalls

214. ... More specifically, in the compressed program 504 when the processor encounters the

first microcall at line number 508, the processor preferably transfer control to the first line, M1,

510 in the Microcode area 507 (i.e., the first line in Microroutine #1 504)." in column 7, lines 24-

33; column 11, lines 57-67 to column 12, lines 1-67; and Fig. 5B).

Per Claim 24:

The Siska patent discloses:

- wherein said reference value is determined upon an optimum between: a length code

value of said sequences, and a number of different sequences in said intermediate program

(column 7, lines 49-56; column 7, lines 64-67 to column 8, lines 1-5).

Per Claim 25:

The Siska patent discloses:

- wherein said function is also a function of the size of each identical sequence of successive

instructions (column 8, lines 9-23).

Per Claim 26:

The Siska patent discloses:

- wherein in order to compress a plurality of intermediate programs, said method also consists in: storing said execution table relating to at least one compacted intermediate program and, for every additional intermediate program subjected to a compaction process (column 13, lines 10-24), **reading said stored execution table** (column 13, lines 10-20 and lines 38-43), **running the compaction process for every additional program, taking account of the specific codes and instructions stored in said execution table** (column 13, lines 21-37).

Per Claim 27:

The Siska patent discloses:

- a method of running a compacted intermediate program obtained by applying a compaction method, said compacted intermediate program consisting of a succession of standard instructions and specific operating codes stored in the memory of an on-board system (column 5, lines 33-39; column 13, lines 10-37; Fig. 4, item 400 "UNCOMPRESSED PROGRAM"; microprocessors are commonly referred to as embedded processors; that is, microprocessors are relied upon to perform numerous and varied functions for portable objects, such as personal digital assistants, smart phones, and etc. Therefore, Siska does disclose an on-

board system. Siska also discloses an intermediate program, see Fig. 4, item 400

"UNCOMPRESSED PROGRAM".)

- **recognizing in said memory the existence of a stored execution table containing at least one sequence of successive instructions associated with a specific operating code by means of a reciprocal link** (column 13, lines 10-20 and lines 38-52)

- **calling up a command, via a program language interpreter, to read the successive standard instructions or specific operating codes of said compacted intermediate program, in the presence of a specific operating code: retrieving said sequence of successive instructions associated with said specific operating code from the memory by means of a read instruction** (column 11, lines 57-67 to column 12, lines 1-67; column 13, lines 38-43; and Fig. 5B), **in the presence of a standard instruction, commanding the execution of said standard instruction by means of a read instruction** (column 13, lines 28-37 and Fig. 5B)

- **said interpreter being adapted to determine whether a read code value corresponds to a standard type code or to a specific type code, making it possible to execute specific instructions, by calling on said execution table** (column 11, lines 57-67 to column 12, lines 1-67; and Fig. 5B).

Per Claim 28:

The Siska patent discloses:

- wherein if a sequence of successive instructions associated with a specific operating code is called up, the current value of a program counter is incremented in a stack associated with the specific operating codes and a program pointer points to the first instruction of said sequence of specific instructions, after which, on running an instruction to end the sequence of specific instructions, said program counter is decremented and the execution process continues starting with the next instruction or specific operating code (column 13, lines 43-61).

Per Claim 29:

The Siska patent discloses:

- wherein the stack associated with the specific operating codes and a stack associated with the standard instructions are a single stack (column 13, lines 43-52).

Per Claim 30:

This is a system version of the claimed method discussed above, claim 23, wherein all claim limitations also have been addressed and/or covered in cited areas as set forth above. Thus, accordingly, this claim is also anticipated by Siska.

Per Claim 31:

The Siska patent discloses:

- wherein said execution table comprises at least: a file of successive sequences

corresponding to said specific instruction codes (column 13, lines 38-43); a table of specific

instruction codes and addresses at which said specific instruction codes are embedded in

the table of successive sequences (column 13, lines 43-52).

Per Claim 32:

The Siska patent discloses:

- wherein said file of successive sequences corresponding to said specific instruction codes

and said table of specific instruction codes are stored in a programmable memory of said

on-board system (column 13, lines 10-20).

Per Claims 33 & 34:

These are compaction system versions of the claimed method discussed above (claims 23

and 25), wherein all claim limitations also have been addressed and/or covered in cited areas as

set forth above. Thus, accordingly, these claims are also anticipated by Siska.

Response to Arguments

20.   Applicant's arguments with respect to claims 23-34 have been considered but are moot in

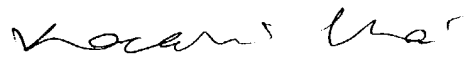view of the new ground(s) of rejection.

Conclusion

21.   Any inquiry concerning this communication from the examiner should be directed to

Qamrun Nahar whose telephone number is (703) 305-7699. The examiner can normally be

reached on Mondays through Thursdays from 9:00 AM to 6:30 PM. The examiner can also be

reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Kakali Chaki, can be reached on (703) 305-9662. The fax phone number for the

organization where this application or processing is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding

should be directed to the receptionist whose telephone number is (703) 305-3900.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

QN
August 2, 2004

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